



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
OREGON OPERATIONS OFFICE
805 SW Broadway, Suite 500
Portland, Oregon 97205

June 12, 2009

Mr. Robert Wyatt
Northwest Natural & Chairman, Lower Willamette Group
220 Northwest Second Avenue
Portland, Oregon 97209

Re: Portland Harbor Superfund Site; Administrative Order on Consent for Remedial Investigation and Feasibility Study; Docket No. CERCLA-10-2001-0240 – EPA comments on Portland Harbor Remedial Action Objectives

Dear Mr. Wyatt:

EPA has reviewed the Draft Remedial Action Objectives Text (RAO Text) dated April 24, 2009. The draft RAO Text was developed by the Lower Willamette Group (LWG) in response to a draft set of RAOs and associated management goals developed by the EPA following of a series of meetings and exchange of information regarding the development of RAOs for the Portland Harbor site. EPA comments on the RAO text are attached. In addition, EPA has developed a table that summarizes the most recent EPA and LWG iteration of the RAOs and associated management goals and presents a set of recommended RAOs and associated management goals for the Portland Harbor site.

EPA believes that the attached RAO language addresses concerns raised by the LWG and at the same time, is consistent with the National Contingency Plan (NCP) and EPA's Contaminated Sediment Guidance. Although management goals are not contemplated in the NCP and are only briefly discussed in the Contaminated Sediment Guidance, EPA believes that these management goals are appropriate for the Portland Harbor site and has described how these management goals should be addressed in the Portland Harbor feasibility study (FS).

EPA expects to finalize the RAOs and associated management goals in the near future and looks forward to discussing this topic with you at our next management meeting that is currently being scheduled for the week of June 15, 2009.

If you have any questions, please contact Chip Humphrey at (503) 326-2678 or Eric Blischke (503) 326-4006. All legal inquiries should be directed to Lori Cora at (206) 553-1115.

Sincerely,

Chip Humphrey
Eric Blischke
Remedial Project Managers

cc: Greg Ulirsch, ATSDR
Rob Neely, NOAA
Ted Buerger, US Fish and Wildlife Service
Preston Sleeper, Department of Interior
Jim Anderson, DEQ
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Michael Karnosh, Confederated Tribes of Grand Ronde
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Audie Huber, Confederated Tribes of Umatilla
Brian Cunningham, Confederated Tribes of Warm Springs
Erin Madden, Nez Perce Tribe
Rose Longoria, Confederated Tribes of Yakama Nation

EPA COMMENTS ON DRAFT REMEDIAL ACTION OBJECTIVES TEXT
JUNE 12, 2009

EPA has reviewed the Draft Remedial Action Objectives Text (RAO Text) dated April 24, 2009. The draft RAO Text was developed by the Lower Willamette Group in response to a draft set of RAOs developed by the EPA. The draft RAOs developed by EPA were dated April 13, 2008 and were discussed during the April 15, 2009 Management Meeting. These comments focus on the six RAOs, three Management Goals and supporting text.

In general, EPA is supportive of the RAOs and Management Goals presented in the draft RAO Text. EPA's primary comments is that the RAOs should include an explicit statement in the RAO that any identified ARARs will be complied with because ARARs are threshold criteria under CERCLA.

Introduction:

The second sentence of the parenthetical introductory statement should be modified to recognize that the risk assessment has not been completed or reviewed by EPA; it would be more appropriate to state that "once initially refined following EPA's review of the risk assessment, the RAOs will be refined over time..."

Sediments should be defined in Section 1.0 consistent with the definition of sediments provided below.

Remedial actions should not be limited to the "bioactive layer of surface sediments." The effect of subsurface sediments in conjunction with contaminant fate and transport processes must also be considered in the evaluation of remedial action alternatives. Furthermore, RAOs should encompass situations such as buried sediment contamination covered by relatively clean surface sediment in areas of erosion.

EPA does not agree with the following statement: "However, the sediment remedy by itself is unlikely to reduce overall exposures to acceptable levels because contributions of COCs from other sources within and outside the site are substantial." This statement should be deleted.

The statement that begins with "The RAOs are specific to the..." should be changed to "specific to the anticipated scope of the Portland Harbor Feasibility Study for the in-water portion of the site."

The term "all societal sources" should be replaced with "other sources."

Definitions:

Sediments: EPA agrees with the inclusion of pore water (also referred to as interstitial water and transition zone water) in the sediment definition. However, EPA has defined sediments as "soils, sand, organic matter, or minerals that accumulate on the river bottom and extend up to the

ordinary high water mark (13.3 feet NAVD88) along the banks (including beach sediments) within the Portland Harbor Superfund Site. The riparian soils are found along the river banks from the ordinary high water mark to the mean high water mark (20 feet NAVD88). Riparian soils will be treated as sediments when they have a direct effect upon sediments and surface water below the ordinary high water mark. Note that riparian soils between 13.3 and 20 feet NAVD88 are not excluded from the site and being evaluated in the human health and ecological risk assessments.

Site: EPA does not agree with the definition as presented in the draft RAO Text. As stated above, sediments are limited to material below the ordinary high water mark and riparian soils are located between the ordinary and mean high water marks. Riparian soils and specific upland sites where source control has not been achieved may be included in the site boundary in the Portland Harbor Record of Decision (ROD). In addition, the site boundary may encompass a different river mile segment than RM 1.9 – 11.8 based on the distribution of site contaminants. EPA recommends eliminating the definition of site in this section.

Biologically Active Zone: The biologically active zone is the depth to which exposure to benthic organisms occurs. This depth varies throughout the site based on the nature of the sediment bed and the type of benthic organism present. As a practical matter, data from surface sediments collected between 0 and 30 cm will be used to represent conditions in the biologically active zone.

RAOs

EPA has provided specific comments on each of the RAOs. In general, the RAOs should include compliance with any identified ARARs explicitly, rely on the global definition of sediment provided above rather than restating it for each RAO, and not limit the RAO to sediments only. The supporting text should be used to clarify that the goal of the RAO is to reduce risk through sediment remedies. A comparison of EPA and LWG RAOs and EPA proposed language is provided in the attached table.

RAO 1 – Sediments/Human Health-Direct. Reduce to acceptable levels human health risks from direct exposures to COCs from sediment through incidental ingestion of and dermal contact with sediments.

This RAO is generally consistent with agency RAO 1. This RAO does not include the fish consumption pathway which is covered by RAO 2 and the protection of the Willamette River as a drinking water supply which is more logically covered by RAO 3. This RAO is generally acceptable. However, the RAO must include compliance with any identified ARARs for groundwater (which is included as part of the sediment definition). Note that ARARs are threshold criteria under CERCLA.

RAO 2 – Sediment/Human Health-Indirect. Reduce to acceptable levels human health risks from indirect exposures to COCs from sediment through ingestion of fish and shellfish (via bioaccumulation pathways from sediment and/or from sediment to surface water).

This RAO represents a separation of agency RAO 1 into two RAOs – direct and indirect and includes contribution of sediment contamination to surface water. Supporting text includes language regarding contribution toward elimination of Portland Harbor PCB fish advisories. EPA agrees that “this RAO is intended to include exposures that occur, consistent with the findings of the risk assessment, either primarily through the solid or pore water portions of the sediment matrix or both. This RAO is expected to result in PRGs that are primarily expressed in terms of whole sediment COC concentrations.” This RAO is generally acceptable. However, this RAO must include compliance with any identified fish consumption ARARs (i.e., water quality criteria for the protection of human health) for surface water and/or groundwater. Note that ARARs are threshold criteria under CERCLA. Consistent with RAO 5, The RAO should also include bioconcentration in addition to bioaccumulation.

RAO 3 – Surface Water/Human Health-Direct. Reduce, to the extent appropriate, the contribution of sediments, including sediment porewater, to COC concentrations in surface water to acceptable levels based on human health risks from direct exposures (i.e., incidental ingestion of and dermal contact) to surface water.

This RAO focuses on contribution of sediment to surface water contamination but considers direct exposure only (ingestion and dermal contact). Although the supporting text includes compliance with ARARs “to the extent appropriate for a sediment cleanup,” the RAO should explicitly include compliance with any identified ARARs (i.e., comply with identified ARARs and reduce, to the extent appropriate...). EPA agrees with supporting text statement that “the goal would also be to contribute to meeting at the site potential chemical-specific surface water ARARs, if any that may be relevant and appropriate to the RAO, as well as surface water PRGs developed from the risk assessment. Human health ARARs for surface water at the site include state water quality standards for the protection of human health and safe drinking water act maximum contaminant levels (MCLs).

RAO 4 – Sediment/Ecological-Direct. Reduce to acceptable levels ecological risks from direct exposures to COCs in the biologically active zone (BAZ) of sediments.

This RAO focuses on risks from direct contact with sediments, including interstitial water and stranded wedges of groundwater contamination and does not include indirect exposure (i.e., prey ingestion) which is addressed in RAO 5 below. This RAO is generally acceptable. However, this RAO must include compliance with any identified ARARs (i.e., water quality criteria for the protection of aquatic life) for groundwater. Note that ARARs are threshold criteria under CERCLA.

RAO 5 – Sediment/Ecological-Indirect. Reduce to acceptable levels ecological risks from indirect exposures to COCs in sediments (via bioaccumulation pathways from sediment and/or from sediment to surface water).

This RAO focuses on indirect exposure. The stated goal in the supporting text is to “reduce ecological exposure to COCs in sediments indirectly via bioaccumulation and bioconcentration and consumption of contaminated prey.” EPA agrees that this “RAO is expected to result in

PRGs that are primarily expressed in terms of whole sediment COC concentrations.” This RAO is generally acceptable.

RAO 6 – Surface Water/Ecological-Direct. Reduce, to the extent appropriate, the contribution of sediments, including sediment porewater, to COC concentrations in surface water to acceptable levels based on ecological risks from direct contact.

Focus of RAO is to “reduce risks from sediment contributing to COC concentrations in surface water to the extent appropriate through sediment cleanup to levels that reduce direct toxicity from COCs for the ecological communities at the site. Includes attainment of ARARS “to the extent appropriate for a sediment cleanup.” Specifically mentions meeting “chemical-specific surface water ARARS that may be relevant and appropriate to the RAO, as well as surface water PRGs.” This RAO is generally acceptable. However, this RAO must include compliance with any identified ARARS (i.e., water quality criteria for the protection of aquatic life) for surface water. Note that ARARS are threshold criteria under CERCLA.

Management Goals:

EPA comments on the LWG proposed Management Goals are provided below. A comparison of EPA and LWG Management Goals and EPA proposed language is provided in the attached table. The end of the introductory paragraph should include the following language: “3) or to identify remedial strategies that would enhance aquatic habitat. These management goals will be carried forward into the FS to enhance the overall remedy for the site.”

Management Goal 1 – Source Control. Ensure sediment cleanup activities consider, compliment, and are compatible with, upland and upstream source control efforts to prevent the recontamination by COCs in groundwater, stormwater, soil erosion, upstream sources and overwater activities at the site to allow for the achievement of site cleanup RAOs.

This is essentially the agency Management Goal 2 which is to ensure that in-water remedies and upland source control are considered in an integrated manner. The LWG Management goal states that “the goal is to have a sediment cleanup that supports upland and upstream source controls that prevent sediment recontamination after cleanup. Further states that any “sediment remediation activities should not hinder upland source control actions and water quality programs.” The Management Goal recognizes the need for “upland source control activities need to be implemented prior to sediment cleanup to minimize the potential for recontamination after cleanup” and states that the “FS will include an evaluation of the potential for in-river risks and recontamination from ongoing upland and upstream sources as allowed by existing data and information.” The Management Goal commits the FS to estimating “as existing information allows, the source reduction levels on a site-wide basis that would be expected to meet various potential sediment and water PRGs including the uncertainty of such estimates.” This management goal is generally acceptable.

Management Goal 2 – Minimize Downstream COC Transport. To the maximum extent practicable, minimize the long-term transport of sediment COCs from the site to the Columbia River and the Multnomah Channel.

This is equivalent to former agency Management Goal 3. It states that this management goal will be evaluated in the FS under long term effectiveness. This management goal is acceptable.

Management Goal 3 – Clean up contaminated sediments in a manner that promotes habitat that will support a healthy aquatic ecosystem and the conservation and recovery of threatened and endangered species.

This is similar to current agency Management Goal 3 (former Management Goal 4). However, Management Goal 3 is limited to compliance with ARARs (e.g., Section 404 of the CWA, ESA) and states that this management goal will be evaluated in the FS under the long term effectiveness and compliance with ARARs criteria. The management goal specifically excludes “evaluation of any potential or needed restoration activities under the Natural Resource Damages Assessment (NRDA) provisions of CERCLA, the Clean Water Act, and the Oil Protection Act (OPA) consultation with NOAA.” This management goal is generally acceptable. However, the management goal should include consideration of future land-use (e.g., future habitat areas) in the FS.

Proposed Draft Remedial Action Objectives and Site-Wide Management Goals for the Portland Harbor Site (Site)
U.S. Environmental Protection Agency (June 12, 2009)

Portland Harbor Site Remedial Action Objectives ¹								
	EXPOSURE MEDIA	EXPOSURE PATHWAYS AND RECEPTORS	EPA POTENTIAL REMEDIAL ACTION OBJECTIVE (RAO)	EPA SUPPORTING TEXT	LWG POTENTIAL REMEDIAL ACTION OBJECTIVE (RAO)	LWG SUPPORTING TEXT	RECONCILED POTENTIAL RAOS	RECONCILED SUPPORTING TEXT
1	Sediment ² and groundwater	<p><u>Pathways</u>- Incidental ingestion of and dermal contact with sediments and groundwater while fishing, recreating, working, living (transients) and recreational/commercial diving; ingestion of fish and shellfish, protection of the Willamette River as a drinking water supply.</p> <p><u>Receptors</u>- Dockside Worker, In-water Worker, Adult and Child Recreational Beach User, Transient, Native American Fisher and Non-tribal Fisher</p>	Comply with identified ARARs and reduce to acceptable levels the risk from exposure to contaminated sediments and contaminated interstitial water resulting from Incidental ingestion of and dermal contact with sediments and the ingestion of fish and shellfish at the site, and drinking water supply.	The goal is to reduce COC concentrations and prevent direct human exposure to contaminated sediments and contaminated interstitial water or consumption of contaminated biota that exceed risk-based threshold concentrations as defined by the risk assessment or have contaminant of concern concentrations (COCs) that exceed preliminary remediation goals (PRGs) for sediment at the site; comply with ARARs identified for the site; protect the beneficial uses of the Willamette River at the site; and contribute to the elimination of existing fish consumption advisories at the site.	Reduce to acceptable levels human health risks from direct exposures to COCs from sediment through incidental ingestion of and dermal contact with sediments.	This RAO applies to direct human health sediment exposure scenarios found to have an unacceptable risk in the risk assessment. The goal is to reduce risks from human exposure to COCs in sediments through sediment cleanup. Sediment is defined to include both the solid and pore water (also sometimes termed interstitial water or TZW) portions of the sediment matrix. This RAO is intended to include exposures that occur, consistent with the findings of the risk assessment, either primarily through the solid or pore water portions of the sediment matrix or both. COCs that occur primarily in the pore water in areas of potentially stranded groundwater plumes and that have been shown to pose risks, if any, via these human health exposures are specifically intended to be addressed by this sediment RAO.	Comply with identified ARARs and reduce to acceptable levels the risk from exposure to contaminated sediments and groundwater resulting from Incidental ingestion of and dermal contact with sediments.	This RAO applies to direct human health sediment exposure scenarios found to have an unacceptable risk in the risk assessment. The goal is to reduce COC concentrations and prevent human exposure to contaminated sediments groundwater through sediment remedies for chemicals that exceed risk-based threshold concentrations as defined by the risk assessment or have contaminant of concern concentrations (COCs) that exceed preliminary remediation goals (PRGs) for sediment at the site; comply with any chemical specific ARARs identified for the site; and protect the beneficial uses of the Willamette River at the site. This RAO is intended to include exposures that occur either primarily through the solid or groundwater portions of the sediment matrix or both. COCs that occur primarily in the groundwater and that have been shown to pose a risk to human health will be addressed by this RAO.

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2	Biota Tissue	<u>Pathways:</u> Ingestion of fish and shellfish. <u>Receptors:</u> Native American Fisher and Non-tribal Fisher	Not applicable. Included as part of RAOs 1 and 3.	Not applicable. Included as part of RAOs 1 and 3.	Reduce to acceptable levels human health risks from indirect exposures to COCs from sediment through ingestion of fish and shellfish (via bioaccumulation pathways from sediment and/or from sediment to surface water).	This RAO applies to indirect human health sediment exposure scenarios found to have an unacceptable risk in the risk assessment. The goal of this RAO is to reduce risks to humans from indirect exposures to COCs through eating fish and shellfish that are exposed to COCs from sediments via bioaccumulation. Thus this RAO addresses COCs that enter the food chain from sediments as well as sediment COCs that enter the surface water before entering the food chain. This RAO is expected to contribute to the reduction and elimination of Portland Harbor PCB fish consumption advisories, to the extent appropriate, through reduction in sediment chemical contributions to fish tissue. It is recognized that reduction and elimination of the Portland Harbor fish advisory can only be achieved when conducted in conjunction with other Portland Harbor source controls and other PCB reduction efforts conducted under other regulations and other PCB reduction efforts conducted under other regulations and programs within the Willamette River watershed, as described in the Source Control Management Goal below. Sediment is defined to include both the solid and pore water (also sometimes termed interstitial water or TZW) portions of the sediment matrix. This RAO is intended to include exposures that occur, consistent with the findings of the risk assessment, either primarily through the solid or pore water portions of the sediment matrix or both. This RAO is expected to result in PRGs that are primarily expressed in terms of whole sediment COC concentrations.	Comply with identified ARARs and reduce to acceptable levels human health risks from exposures to COCs through ingestion of fish and shellfish.	This RAO applies to fish and shellfish consumption human health exposure scenarios found to have an unacceptable risk in the risk assessment. The goal is to reduce COC concentrations in biota tissue through sediment remedies to levels that protect humans from exposures to COCs through eating fish and shellfish that are exposed to COCs via bioaccumulation and bioconcentration, that exceed preliminary remediation goals (PRGs) for sediment at the site; comply with any chemical specific ARARs identified for the site; and protect the beneficial uses of the Willamette River at the site. This RAO is expected to contribute to the reduction and elimination of Portland Harbor PCB fish consumption advisories. It is recognized that reduction and elimination of the Portland Harbor fish advisory can only be achieved when conducted in conjunction with other Portland Harbor source controls and PCB reduction efforts conducted under other regulations and programs within the Willamette River watershed, as described in the Source Control Management Goal below.

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3	Surface Water	<u>Pathways</u> - Ingestion of and dermal contact with surface water. <u>Receptors</u> - Adult and Child Recreational Beach User, Transient Native American Fisher, Non-tribal Fisher	Comply with identified ARARs and reduce COC concentrations in surface water at the site to acceptable exposure levels and comply with ARARs that are protective of human health based on ingestion of and dermal contact with surface water and the ingestion of fish and shellfish.	The goal is to reduce COC concentrations in surface water through sediment remedies to levels that protect humans from the ingestion and dermal contact of surface water, and the ingestion of fish and shellfish that exceed risk-based threshold concentrations as defined in the risk assessment at the Portland Harbor site; comply with ARARs identified for the site; contribute to the elimination of existing fish consumption advisories at the site and protect the beneficial uses (domestic/private water supply and fishing) of the Willamette River at the site.	Reduce, to the extent appropriate, the contribution of sediments, including sediment porewater, to COC concentrations in surface water to acceptable levels based on human health risks from direct exposures (i.e., incidental ingestion of and dermal contact) to surface water.	This RAO applies to direct human health surface water exposure scenarios found to have an unacceptable risk in the risk assessment. This includes incidental ingestion of and dermal contact with surface water. The goal is to reduce the contribution of sediments to COC concentrations in surface water to the extent appropriate through a sediment cleanup to levels that protect humans from the incidental ingestion of and dermal contact with surface water. To the extent appropriate for a sediment cleanup, the goal would also be to contribute to meeting at the site potential chemical-specific surface water ARARs, if any, that may be relevant and appropriate to the RAO, as well as surface water PRGs developed from the risk assessment ⁶ . Risks from sediment chemical bioaccumulation indirectly via surface water and into the food chain are covered under RAO 2 regarding indirect sediments exposure.	Comply with identified ARARs and reduce COC concentrations in surface water at the site to acceptable exposure levels that are protective of human health based on ingestion of and dermal contact with surface water; protect the drinking water beneficial use of the Willamette River at the site.	This RAO applies to direct human health surface water exposure scenarios found to have an unacceptable risk in the risk assessment and the protection of the drinking water beneficial use of the Willamette River. The goal is to reduce COC concentrations in surface water through sediment remedies to levels that protect humans from the ingestion and dermal contact of surface water; comply with any chemical specific ARARs identified for the site; and protect the beneficial uses (domestic/private water supply) of the Willamette River at the site.

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4	Sediment ² and groundwater	<u>Pathways</u> - Ingestion of and direct contact with sediments and groundwater. <u>Receptors</u> - Benthic Invertebrates Fish, Shellfish, Aquatic Dependent Wildlife, Shorebirds, Amphibians.	Comply with identified ARARs and reduce to acceptable levels the risk to the benthic community, fish, shellfish and aquatic dependent wildlife resulting from the ingestion of and direct contact with sediments and interstitial waters and ingestion of prey items.	The goal is to reduce COC concentrations and prevent direct exposure to contaminated sediments and associated interstitial water at the site to protect benthic organisms from the direct or indirect bioconcentration and bioaccumulation of COCs; protect predators that prey upon benthic organisms; prevent unacceptable impacts to growth, reproduction, and survivability to benthic organisms at the site; and, comply with any chemical specific ARARs identified for the site.	Reduce to acceptable levels ecological risks from direct exposures to COCs in the biologically active zone (BAZ) of sediments.	This RAO applies to all ecological receptors found to have an unacceptable risk in the risk assessment via direct sediment exposure ⁷ . The goal is to reduce risks from BAZ sediment COCs to protect these ecological receptors from the direct exposure to COCs and prevent unacceptable impacts to the benthic community. Sediment is defined to include both the solid and pore water portions of the sediment matrix. This RAO is intended to include exposures that occur, consistent with the findings of the risk assessment, either primarily through the solid or pore water portions of the sediment matrix or both. COCs that occur primarily in the pore water in areas of potentially stranded groundwater plumes and that have been shown to pose risks to these receptors are specifically intended to be addressed by this sediment RAO. Other than for volatile COCs, this RAO is expected to result in PRGs that are primarily expressed in terms of whole sediment COC concentrations.	Comply with identified ARARs and reduce to acceptable levels the risk to the benthic community, fish, shellfish aquatic dependent wildlife, shorebirds and amphibians resulting from the ingestion of and direct contact with contaminated sediments and groundwater.	This RAO applies to all ecological receptors found to have an unacceptable risk in the risk assessment via direct sediment exposure. The goal is to reduce COC concentrations and prevent exposure to contaminated sediments and groundwater through sediment remedies at the site to prevent unacceptable effects on the survival, growth, and reproduction of benthic organisms, fish, shellfish and aquatic dependent wildlife at the site; and comply with any chemical specific ARARs identified for the site. This RAO is intended to include exposures that occur, consistent with the findings of the risk assessment, either primarily through the solid or groundwater portions of the sediment matrix or both. COCs that occur primarily in the groundwater and that have been shown to pose risks to ecological receptors will be addressed by this RAO.

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5	Biota Tissue	<u>Pathway:</u> Ingestion of prey <u>Receptors:</u> Benthic Invertebrates, Fish, Shellfish and Aquatic Dependent Wildlife	Not applicable. Included as part or RAOs 4 and 6.	Not applicable. Included as part or RAOs 1 and 3.	Reduce to acceptable levels ecological risks from indirect exposures to COCs in sediments (via bioaccumulation pathways from sediment and/or from sediment to surface water).	This RAO applies to all ecological receptors found to have an unacceptable risk in the risk assessment via indirect sediment exposure. The goal is to reduce risks from COCs in sediments through sediment cleanup and reduce ecological exposure to COCs in sediments indirectly via bioaccumulation and bioconcentration and consumption of contaminated prey. Indirect exposure from sediments is defined as COCs that enter the food chain from sediments and/or sediment COCs that enter the surface water before entering the food chain. Sediment is defined to include both the solid and pore water portions of the sediment matrix. This RAO is intended to include exposures, consistent with the findings of the risk assessment, either primarily through the solid or pore water portions of the sediment matrix or both. This RAO is expected to result in PRGs that are primarily expressed in terms of whole sediment COC concentrations.	Reduce to acceptable levels ecological risks from indirect exposures through ingestion of prey.	This RAO applies to all ecological receptors found to have an unacceptable risk in the risk assessment via indirect exposure. The goal is to reduce COC concentrations in biota tissue through sediment remedies to levels that protect ecological receptors from exposures to COCs through eating fish and shellfish, benthic organisms and other prey items that are exposed to COCs via bioaccumulation and bioconcentration, that exceed preliminary remediation goals (PRGs) for sediment at the site; comply with any chemical specific ARARs identified for the site; and protect the beneficial uses of the Willamette River at the site.
6	Surface Water	<u>Pathway -</u> Ingestion of and direct contact with surface water. <u>Receptors-</u> Benthic Invertebrates Fish, Shellfish, Aquatic Dependent Wildlife.	Comply with identified ARARs and reduce COC concentrations in surface water at the site to acceptable exposure levels that are protective of fish, shellfish and aquatic dependent wildlife based on the ingestion of and direct contact with surface water and ingestion of prey items.	The goal is to reduce COC concentrations in surface water through sediment remedies to levels that reduce direct or indirect bioconcentration and bioaccumulation of COCs to the ecological communities residing in the open waters of the Willamette River and those organisms that prey upon those ecological receptors residing within the river at the site; comply with ARARs identified for the site; and, protect the beneficial uses (fish and aquatic life, wildlife) of the Willamette River at the site.	Reduce, to the extent appropriate, the contribution of sediments, including sediment porewater, to COC concentrations in surface water to acceptable levels based on ecological risks from direct contact.	This RAO applies to all ecological receptors found to have an unacceptable risk in the risk assessment via surface water direct toxicity. ⁹ The goal is to reduce risks from sediment contributing to COC concentrations in surface water to the extent appropriate through sediment cleanup to levels that reduce direct toxicity from COCs for the ecological communities at the site. To the extent appropriate for a sediment cleanup, the goal is to also contribute to meeting at the site potential chemical-specific surface water ARARs that may be relevant and appropriate to the RAO, as well as surface water PRGs	Comply with identified ARARs and reduce COC concentrations in surface water at the site to acceptable exposure levels that are protective of invertebrates, fish, shellfish and aquatic dependent wildlife based on the ingestion of and direct contact with surface water.	This RAO applies to all ecological receptors found to have an unacceptable risk in the risk assessment via surface water. The goal is to reduce COC concentrations in surface water through sediment remedies to levels that prevent unacceptable effects on the survival, growth, and reproduction of benthic organisms, fish, shellfish and aquatic dependent wildlife at the site; comply with any chemical specific ARARs identified for the site; and, protect the beneficial uses (fish and aquatic life, wildlife) of the Willamette River at the site

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Portland Harbor Site-Wide Management Goals ³						
	EPA POTENTIAL SITE-WIDE MANAGEMENT GOAL	EPA SUPPORTING TEXT	LWG POTENTIAL SITE WIDE MANAGEMENT GOAL	LWG SUPPORTING TEXT	RECONCILED SITE WIDE MANAGEMENT GOAL	RECONCILED SUPPORTING TEXT
1	Control sources of contamination at the Portland Harbor site through effective implementation of upland source control measures that allows in-water remedies to proceed in a timely manner, prevents recontamination, complies with in-water ARARs, and is consistent with the remedial action objectives for the site.	This management goal recognizes that a successful site remedy includes the implementation of effective in-water remedies and upland source control measures. The goal in the Portland Harbor site is to include source control as an integral component in addressing how contaminated sediments and groundwater discharging to river are remediated at upland sites. Upland source control activities should be implemented in a manner that reduces risk and minimizes the potential for recontamination by contaminants of concern in groundwater, stormwater, soil erosion and overwater activities at, and upstream from the site, to exposure levels that allow for the achievement of site cleanup goals and comply with ARARs at the Portland Harbor site.	Ensure sediment cleanup activities consider, compliment, and are compatible with, upland and upstream source control efforts to prevent the recontamination by COCs in groundwater, stormwater, soil erosion, upstream sources and overwater activities at the site to allow for the achievement of site cleanup RAOs.	The goal is to have a sediment cleanup that supports upland and upstream source controls that prevent sediment recontamination after cleanup. Further, sediment remediation activities should not hinder upland source control actions and water quality programs being implemented by Oregon DEQ. Upland and upstream source identification and control is being regulated and directed by Oregon DEQ working with other entities within and outside Portland Harbor. The goal of these source controls is to the extent practicable to reduce in-river risk and prevent the unacceptable recontamination of cleaned up sediments. Upland source control activities need to be implemented prior to sediment cleanup to minimize the potential for recontamination after cleanup. The FS will include an evaluation of the potential for in-river risks and recontamination from ongoing upland and upstream sources as allowed by existing data and information. The FS will estimate, as existing information allows, the source reduction levels on a site-wide basis that would be expected to meet various potential sediment and water PRGs including the uncertainty of such estimates. The FS will not attempt to estimate the source reduction actually provided by various individual potential, planned, or implemented source controls at properties along the river or the watershed as a whole.	Ensure sediment cleanup activities consider, compliment, and are compatible with, upland and upstream source control efforts designed to prevent the recontamination by COCs in groundwater, stormwater, soil erosion, upstream sources and overwater activities at the site, comply with ARARs at the site, are consistent with the RAOs for the site and allows in-water remedies at the site to proceed in a timely manner.	This management goal recognizes that a successful site remedy includes the implementation of effective in-water remedies and upland source control measures. The goal is to have a sediment cleanup that supports and is compatible with upland and upstream source controls that prevent sediment recontamination after cleanup. Further, sediment remediation activities should not hinder upland source control actions and water quality programs being implemented by Oregon DEQ. The goal of these source controls is to reduce in-river risk and prevent the unacceptable recontamination of cleaned up sediments. Upland source control activities should be implemented in timeframe and manner that reduces risk and minimizes the potential for recontamination by contaminants of concern in groundwater, stormwater, soil erosion and overwater activities at, and upstream from the site and that allows for the achievement of site cleanup goals and compliance with ARARs at the Portland Harbor site. The FS will include an evaluation of the potential for in-river risks and recontamination from ongoing upland and upstream sources as allowed by existing data and information. The FS will estimate, as existing information allows, the source reduction levels on a site-wide basis that would be expected to meet various potential sediment and water PRGs including the uncertainty of such estimates. The FS will not attempt to estimate the source reduction actually provided by various individual potential, planned, or implemented source controls at properties along the river or the watershed as a whole.

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U.S. Environmental Protection Agency (June 12, 2009)

Portland Harbor Site-Wide Management Goals ³						
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2	Ensure remedial activities consider, complement, and are compatible with, upland source control efforts to prevent the recontamination by COCs in groundwater, stormwater, soil erosion, upstream sources and overwater activities at the site to allow for the achievement of site cleanup goals.	The goal is to ensure that in-water remedies and upland source control measures are considered in an integrated manner. To the extent practicable, in-water remedies should be compatible with planned or implemented upland source control measures and should not hinder upland source control actions and water quality programs being implemented by Oregon DEQ at the Portland Harbor site.	NA – incorporated into Management Goal 1	NA – incorporated into Management Goal 1	NA – incorporated into Management Goal 1	NA – incorporated into Management Goal 1
	To the maximum extent practicable, minimize the long-term transport of COCs in the Willamette River from the site to the Columbia River and the Multnomah Channel.	The goal is to prevent the migration of contaminated material at levels that would potentially pose unacceptable risks to human health, ecological receptors and habitat downstream of the Portland Harbor site.	Minimize Downstream COC Transport. To the maximum extent practicable, minimize the long-term transport of sediment COCs from the site to the Columbia River and the Multnomah Channel.	The goal is to prevent the migration of sediment COCs at levels that would potentially pose unacceptable risks to human health and ecological receptors downstream of the site. Sediment cleanup alternatives will be evaluated in the FS under the long term effectiveness criterion to clearly estimate, as existing information allows, whether unacceptable downstream transport would be minimized (or not) by each alternative. Minimization of downstream COC transport will be a clear sub-criterion presented in the FS under the more general long term effectiveness criterion.	To the maximum extent practicable, minimize the long-term transport of COCs in the Willamette River from the site to the Columbia River and the Multnomah Channel.	The goal is to prevent the migration of sediment COCs at levels that would potentially pose unacceptable risks to human health and ecological receptors downstream of the site. Sediment cleanup alternatives will be evaluated in the FS under the long term effectiveness criterion to clearly estimate, as existing information allows, whether unacceptable downstream transport would be minimized (or not) by each alternative. Minimization of downstream COC transport will be a clear sub-criterion presented in the FS under the more general long term effectiveness criterion.

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4	Remediate contaminated sediments in a manner that promotes a healthy aquatic ecosystem and the conservation and recovery of threatened and endangered species.	The goal is to ensure that remedies selected for the site consider the benefits of re-establishing ecological habitats in those areas remediated to support a diverse ecosystem.	Clean up contaminated sediments in a manner that promotes habitat that will support a healthy aquatic ecosystem and the conservation and recovery of threatened and endangered species.	The goal is to ensure that sediment cleanup alternatives selected for the site consider the benefits of re-establishing ecological habitats in those areas remediated to support a diverse ecosystem. Sediment remedial actions must comply with ARARs, including the Clean Water Act compensatory mitigation and Section 404(b)(1) analysis and the Endangered Species Act. Other potential ARARs may include the Marine Mammal Protection Act and/or Migratory Bird Treaty Act. The need for habitat mitigation in conjunction with the remedial action alternatives will be evaluated for each detailed sediment cleanup alternative in the FS under the long term effectiveness and compliance with ARARs criteria. To support this evaluation the LWG is seeking a programmatic approach to addressing ESA issues with NOAA (including a programmatic consultation) to help appropriately define the habitat impacts from remediation and types of desirable mitigation. A programmatic approach would support a more comprehensive and integrated watershed evaluation to promote the conservation of species. For each detailed alternative, the FS will clearly describe whether habitat mitigation needs to be included to meet the substantive requirements of potential ARARs. This does not include evaluation of any potential or needed restoration activities under the Natural Resource Damages Assessment (NRDA) provisions of CERCLA, the Clean Water Act, and the Oil Protection Act (OPA).	Clean up contaminated sediments in a manner that promotes habitat that will support a healthy aquatic ecosystem and the conservation and recovery of threatened and endangered species.	The goal is to ensure that sediment cleanup alternatives selected for the site consider the benefits of re-establishing ecological habitats in those areas remediated to support a diverse ecosystem. Sediment remedial actions must comply with ARARs, including the Clean Water Act compensatory mitigation and Section 404(b)(1) analysis and the Endangered Species Act. Other potential ARARs may include the Marine Mammal Protection Act and/or Migratory Bird Treaty Act. The need for habitat mitigation in conjunction with the remedial action alternatives will be evaluated for each detailed sediment cleanup alternative in the FS under the long term effectiveness and compliance with ARARs criteria. For each detailed alternative, the FS will evaluate future land use with respect to habitat and clearly describe whether habitat mitigation needs to be included to meet the substantive requirements of potential ARARs. This does not include evaluation of any potential or needed restoration activities under the Natural Resource Damages Assessment (NRDA) provisions of CERCLA, the Clean Water Act, and the Oil Protection Act (OPA).

¹ RAOs will be refined after the draft human health and ecological risk assessments are made available to EPA and DEQ. These RAOs will be used to evaluate remedial action alternatives in the Portland Harbor Feasibility Study and as the basis for the evaluation, design and implementation of upland source control actions being performed under Oregon Department of Environmental Quality oversight.

²Sediments= soils, sand, organic matter, or minerals that accumulate on the river bottom and extend up to the ordinary high water mark (13.3 feet NAVD88) along the banks (including beach sediments) within the Portland Harbor Superfund Site. The riparian soils are found along the river banks from the ordinary high water mark to the mean high water mark (20 feet NAVD88). Riparian soils will be treated as sediments when they have a direct effect upon sediments and surface water below the ordinary high water mark. (High water mark datum is from Proposed Round 3 Scope of Work, Portland Harbor Superfund Site, February 17, 2008).

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³ Site-Wide Management Goals are those goals that must be considered in the Portland Harbor Feasibility Study to ensure a successful remedy and will require integration with other regulatory mechanisms to implement. These regulatory mechanisms include, but are not limited to, State of Oregon Water Quality and Environmental Cleanup programs. Specific numeric PRGs and remediation goals are not expected to be developed for these management goals as part of the Portland Harbor FS for the in-water portion of the Site. They will be considered in the development of in-water remedial alternatives, assessing compliance with ARARs including section 404 of the Clean Water Act and the Endangered Species Act and as part of the evaluation of long term effectiveness and permanence, implementability, and compatibility with anticipated future uses. EPA expects that upland source control measures to achieve RAOs established for the Portland Harbor Site.